Polymer Activity from the:

Instant Snow Polymer

Grades: 6-8 and 9-12

Science Standards: Content Standard A: Science as Inquiry; Content Standard B: Physical Science; Content Standard E: Science and Technology

Background

Instant Snow Polymer may be obtained from Educational Innovations (#GB-300 or 315 or 320) or Flinn Scientific (Polysnow #PO283). This information has been adapted from Educational Innovations materials.

"Instant Snow Polymer is made by cross-linking molecules of the sodium polyacrylate polymer, the powder in super absorbent diapers…. When water is added, the individual clusters internally hydrate and expand, forming small, fluffy clusters that do not cling to surrounding clusters. This appears as a powdery snow. When more water is added, the water molecules hydrate the external surface of these clusters, and the clusters begin to adhere to one another. This appears as a slush.

…The powder is able to absorb as much as 500 times its mass of pure water within a few seconds….The hydration is dependent upon the purity of the water." Sodium, calcium, and magnesium ions decrease the absorption.

Demonstration:

Use two ziptop bags, one marked "IS" for Instant Snow and one marked "DP" for diaper powder. Add one teaspoon of each kind of polymer to the appropriate bag. Add 40-50 mL of distilled water to each bag and observe the results.

After examining the results, the materials may be taken home in ziptop bags and then allowed to dry out. Also you can heat them in a "low" oven, at about 250º. The materials will return to their original condition and can be used again.

Extensions:

1. Use tap water instead of distilled water and observe the results.
2. Add a little table salt to the hydrated polymer and observe the results.
3. Look at clusters under the microscope. Do they resemble snowflakes? Remember snowflakes have hexagonal shapes due to hydrogen bonding.
4. What happens if you freeze Instant Snow?

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